

## PATENT ABSTRACTS OF JAPAN

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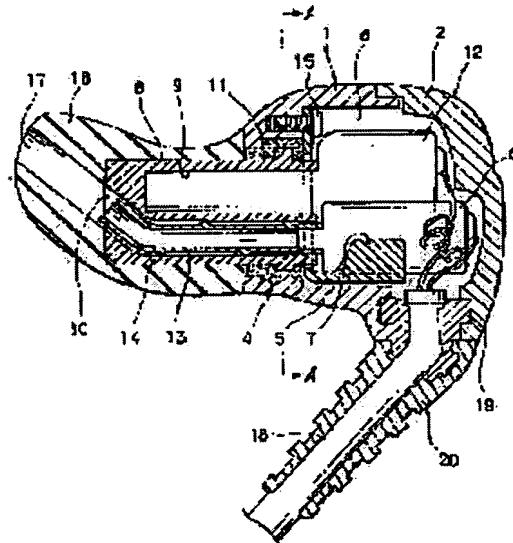
(22)Date of filing : 19.03.1991 (72)Inventor : NABA JIRO

## (54) EAR MICROPHONE

## (57)Abstract:

PURPOSE: To provide an ear microphone which has a good responsiveness to acoustic vibration transmitted from an external auditory meatus and is superior in pickup gain and sound articulation.

CONSTITUTION: An audio vibration pickup mechanism 12 in which a vibration- electricity transducer is stored is supported at one point in microphone outer bodies 1 and 2 together with a holder 8 made of plastics or a metal with a damping materials 4, which are made of silicone rubber or silicone gel and have a large coefficient of attenuation, between them. Since the vibration pickup mechanism is supported at one point, so to speak, in the floating state, it is hardly affected by external sounds and has an excellent performance to obtain a high pickup gain and a high articulation, and the ear microphone suitable for bi-directional simultaneous speech is obtained.



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## CLAIMS

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[Claim(s)]

[Claim 1] the mold both for carrier transmission which has arranged an oscillating electrical-and-electric-equipment sensing element and sound-pressure mold loudspeakers, such as a piezo-electric element which detects bone-conduction voice vibration and changes this into an electrical signal, in the same case -- disagreeable -- the electrode holder which consists the voice vibration pickup device which contained said oscillating electrical-and-electric-equipment sensing element of plastics or a metal in a - microphone -- the object outside a microphone -- damping coefficients, such as silicone rubber or silicon gel, -- size -- it is characterized by to support one point through a high-damping material -- disagreeable -- a - microphone.

[Claim 2] while forming the insertion section to external auditory meatus by silicone rubber etc., attachment and detachment were made free to the body -- being according to claim 1 --  
disagreeable - microphone.

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**DETAILED DESCRIPTION**

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**[Detailed Description of the Invention]****[0001]**

[Industrial Application] this invention builds in the device and sound pressure mold loudspeaker which take up the bone conduction voice vibration in external auditory meatus, and a bidirectional coincidence message is possible -- disagreeable -- it is related with - microphone.

**[0002]**

[Description of the Prior Art] the above-mentioned type is disagreeable -- as a - microphone, the thing given in JP,58-210793,A is known, for example. the mass by which the voice vibration pickup device in there is inserted in external auditory meatus -- size -- it fixes to an insertion object rigid -- having -- a sound pressure mold loudspeaker -- an elastic modulus -- size -- the damper by the ingredient -- minding -- mass -- size -- it is fixed to an outside object and said insertion object and outside object are joined inside through the elastic member holding space.

**[0003]**

[Problem(s) to be Solved by the Invention] the above-mentioned former is disagreeable - microphone -- setting -- mass, such as zinc dies casting, -- size -- in order to carry out adhesion immobilization of the insertion object formed with the ingredient, and the outside object through the shaping silicon of 30 degrees of hardness or more, polyurethane rubber, etc., instability and manufacture are structurally difficult and there is anxiety in respect of reinforcement. Moreover, since it is direct fixed to the insertion object with which a vibration pickup component becomes mass size, there is a fault that the responsibility over voice vibration transmitted from external auditory meatus is inferior, and pickup gain and voice articulation are inferior. then, this invention does not have the above-mentioned fault -- disagreeable -- it aims at offering - microphone.

**[0004]**

[Means for Solving the Problem] In - microphone the mold both for carrier transmission which

has arranged an oscillating electrical-and-electric-equipment sensing element and sound pressure mold loudspeakers, such as a piezo-electric element which this invention detects bone conduction voice vibration, and changes this into an electrical signal, in the same case -- disagreeable -- the electrode holder which consists the voice vibration pickup device which contained said oscillating electrical-and-electric-equipment sensing element of plastics or a metal -- the object outside a microphone -- damping coefficients, such as silicone rubber or silicon gel, -- size -- it is characterized by supporting one point through a high-damping material -- disagreeable - microphone -- With, the above-mentioned technical problem was solved. it is the insertion section to external auditory meatus -- disagreeable -- it is desirable to make attachment and detachment free to a body while forming - chip by non-hard material, such as silicone rubber.

[0005]

[work --] for when one vibration pickup device was supported by the condition of so to speak having floated and made gross mass of a vibration pickup device light as compared with an outside object, voice vibration by which external-auditory-meatus corkscrew twist transfer was carried out was inserted in external auditory meatus -- disagreeable -- it is efficiently taken up through - chip, with high pickup gain and high articulation are obtained.

[0006]

[Example] It is based on a drawing and the desirable example of this invention is explained. Drawing 1 is drawing of longitudinal section of the example of this invention, it is the cap on which 1 is joined to a plug and 2 is joined to a plug 1 in there, and both join together, an outside object is constituted and the hollow room 3 is formed inside. 4 is the cap 2 of a plug 1, and the annular damper which has the stage attached in opposite side opening, for example, is taken as the product made from a high-damping material with a big damping coefficient like silicone rubber or silicon gel.

[0007] A damper 4 is pressed down from the inside by the L type plate 5 fixed to the plug 1 by the screw 15 or the pin, and is stopped. It considers as metal, the product made of vibration-deadening nature compound resin, etc., the horizontal level is extended crosswise, and is made with the support-from-under section 7 which curves in the shape of a hemicycle, the sound pressure mold loudspeaker 6 is settled there, and the L type plate 5 is supported so that cap 2 may not be contacted at plug 1 list. 8 -- the vibration pickup device insertion section 9 and a sound -- a conduit -- the electrode holder which formed the insertion hole 10 -- it is -- the small metal or vibration-deadening nature composite material of mass with large specific gravity -- with, it is manufactured. A projected part 11 is attached around the damper contact side of an electrode holder 8, and when the projected part 11 eats to a damper 4, one electrode holder 8 is supported by the damper 4.

[0008] The long section of the vibration pickup device 12 is densely fitted in the vibration

pickup device insertion section 9 of an electrode holder 8, with the vibration pickup device 12 is supported there. moreover, a sound -- a conduit -- as for the insertion hole 10, the \*\*\*\* tube 13 with which the point was attached there by having become upward for a while at the sound emission section of the sound pressure mold loudspeaker 6 is inserted. two or more projections 14 prepare in the peripheral surface of the \*\*\*\* tube 13 -- having -- the peripheral surface of the \*\*\*\* tube 13, and a sound -- a conduit -- the gap is held between insertion hole 10 insides.

[0009] 16 was attached in the electrode holder 8 -- disagreeable -- it is - chip and desorption is made it is desirable and possible there. disagreeable -- the - chip 16 -- the ear hole insertion section -- it is -- silicone rubber etc. -- with, it is fabricated. disagreeable -- the - chip 16 -- a sound -- a conduit -- the sound emission hole 17 which is open for free passage to the insertion hole 10 is formed. 19 is the cable clamp installed in a plug 1 and lower base opening of cap 2, and supports a cable 18. 20 is a cable bush.

[0010] Although vibration emitted from the sound pressure mold loudspeaker 6 is transmitted to the outside object which consists of a plug 1 and cap 2 through the supporter, since it is arranged as a system which became independent structurally with the damper 4 made from a high-damping material which has a rate of periodic damping with high outside object and vibration pickup device 12, there is no mutual acoustical association of the sound pressure mold loudspeaker 6 and the vibration pickup device 12. Therefore, even if it uses for the bidirectional (duplex) walkie-talkie which uses the means of communications by which the transmission-and-reception talk is performed to coincidence, for example, a cable, and two carrier frequencies in radiotelephony, the howling by feedback is not generated and the bidirectional coincidence transmission-and-reception talk becomes possible.

[0011] a part of vibration from the sound pressure mold loudspeaker 6 hits the insertion section to external auditory meatus -- disagreeable -- disagreeable, although transmitted through the - chip 16 -- the - chip 16 -- elastic material, such as silicone rubber, -- with, the fabricated attachment and detachment are free, and since it is small compared with a touch area with the vibration pickup device 12, the touch area with the outside object can disregard the effect.

[0012] furthermore, the \*\*\*\* tube 13 in which sound pressure vibration generated from the sound emission section of the sound pressure mold loudspeaker 6 is formed with ingredients, such as Teflon, -- letting it pass -- the inside of external auditory meatus, although sound emission is carried out In order that it may be set as the die length to which the \*\*\*\* tube 13 does not generate resonance to an audio frequency band at this time and the direct vibration from the \*\*\*\* tube 13 may carry out that it is hard to be transmitted to the vibration pickup device 12, disagreeable [ consider as the structure in which maintenance immobilization is carried out by projection 14 in the part of several points and ] -- as for the sound emission hole 17 of the - chip 16, it is desirable to be combined in a smooth configuration so that the sound

pressure vibration from the \*\*\*\* tube sound emission section may not reflect.

[0013] When the cord which can serve as a practical noise generation source touches clothes, the vibration when touching a cord directly By combining and using outside a cord the member from which plurality differed, for example, polypropylene, polyurethane, ABS plastics, vibration-deadening nature composite material, etc. for the junction over the body according to the application It will be transmitted through the ingredient which has the resonant frequency from which plurality differed, and thereby, on a multistage story, contact vibration of a cord is decreased, it is negated and decreases. It is more desirable that the envelope of a cord is also covered with smooth ingredients, such as Teflon.

[0014] although the effect by the ambient noise is transmitted to the body outside direct as vibration, as mentioned above, the former of an outside object and the vibration pickup device 12 is disagreeable according to [ since it becomes the system which became independent structurally, are not transmitted to a vibration pickup device therefore ] this invention -- as compared with - microphone, there is more little effect of an outside sound, namely, it excelled in noise-proof nature -- disagreeable - microphone can be offered. In order to lessen this effect more, it is an effective means to make [ which also has a smooth configuration ] projected area of an outside object possible the smallest.

[0015]

[Effect of the Invention] this invention is suitable for the bidirectional coincidence message of the outstanding engine performance from which it is as having mentioned above, it is hard to be influenced of an outside sound since one vibration pickup device is supported by the condition of so to speak having floated, and high pickup gain and high articulation are obtained -- disagreeable -- it is effective in the ability to offer - microphone.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is drawing of longitudinal section of the example of this invention.

[Drawing 2] It is an A-A line sectional view in drawing 1 .

[Description of Notations]

1 Plug

2 Cap

4 Damper

5 L Type Plate

6 Sound Pressure Mold Loudspeaker

8 Electrode Holder

12 Vibration Pickup Device

13 \*\*\*\* Tube

16 Disagreeable - Chip

17 Sound Emission Hole

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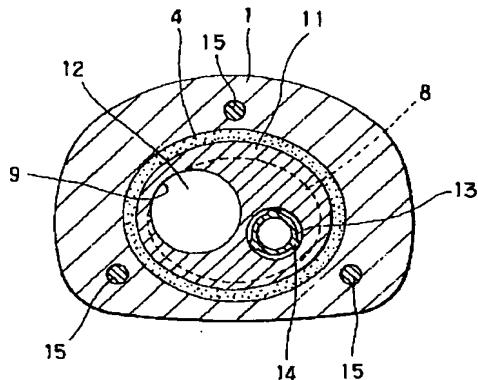
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DRAWINGS

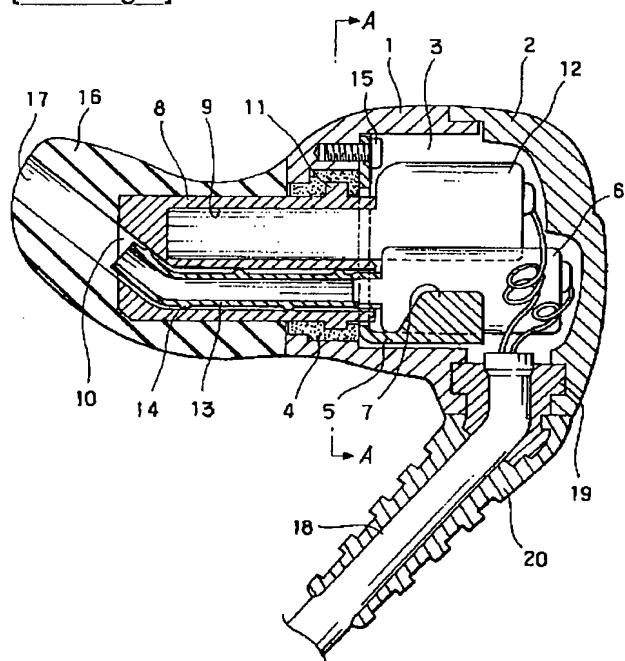
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[Drawing 2]

## BEST AVAILABLE COPY



[Drawing 1]



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